

# A new genus of platyrhacid millipeds from the Lesser Sunda Islands, Indonesia<sup>1</sup>

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With 5 text-figures.

The family *Platyrhacidae* is unusual among the ranks of tropical diplopods for the fact that, as long ago as 1898, names had been already proposed for the great majority of the genera that we can recognize as valid using modern criteria. Particularly in the Indo-australian region, species of this family are quite variable in non-sexual characters, and many of the early generic names were based upon single, disjunct forms without consideration of the genitalic characters. The result is that at the present, there are far more names than valid genera, owing largely to the energetic work of O. F. COOK (1896a, b), who set up 21 names. F. SILVESTRI (1896), who proposed 3 names, and R. I. Pocock (1897), the author of 7 others.

Subsequent to this active initial period of denomination, most of the work with platyrhacids was done by the Count von ATTEMS, whose approach to classification was a notably conservative one. His large monograph of 1898-99 reduced all of the existing names to synonyms of *Platyrhacus*, setting a precedent which was followed by the majority of later workers. Although ATTEMS based his classification upon gonopod characters almost exclusively, he did not in

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many cases achieve correct homologization of various structures, and in any event his "key characters" were often artificially constructed and cut across groupings of species made on the basis of overall similarity of appearance.

At the present time, a reorganization of the platyrhacid species is in progress, in which species groups are being worked out on the basis of comparative morphology and geographic distribution. These groups, which are provisionally regarded as genera for the sake of convenience, have so far contained at least one species upon which a generic name has already been based. During the summer of 1964, however, I was able to study the type series of two species which, although described in "*Platyrhacus*" are so unusual in gonopod structure that they must be accounted as representing a previously unrecognized generic group. Restricted to the Lesser Sunda Islands, these species escaped the attention of early collectors and so were unknown to COOK, POCKOCK, and SILVESTRI, any of whom would have provided them with a generic name.

I wish to express my appreciation to Dr. H. Gisin of the Muséum d'Histoire naturelle, Genève, and to Dr. Otto Kraus, Senckbergischen Naturforschende Gesellschaft, Frankfurt, for the opportunity of studying the type series of the species in collections under their care.

### **Sundarhacus, new genus**

Type species: *Platyrhacus fecundus* Carl, 1912. The genus also includes the putative "subspecies" *Platyrhacus fecundus sterilis* Attems, 1930.

Diagnosis: A genus of small, dark-colored platyrhacids with narrow, depressed paranota and convex middorsum; metatergites evenly granular with at least evident transverse series of larger tubercles; lateral edges of paranota with 4-6 rounded tubercles, usually notched or incised between the 2nd and 3rd; ozopores small, located close to the edge.

Gonopods short, robust, curved cephalodorsad and parallel to each other, prefemora with enormously enlarged, laminate macrosetae (fig. 2) on the ventrolateral side; telopodite rotated somewhat laterally, displacing the seminal groove to a lateral position in its distal half; end of gonopod enlarged, subtriangular in appearance,

the acute apex directed toward the coxa or base of tibiotarsus; a large, sinuously curved flattened solenomerite is present, paralleling the tibiotarsal end in one species, divergent from it in the other. Coxae with several long, distally penicillate macrosetae on the dorsal side.

Range: Known so far only from the Lesser Sunda Islands of Lombok, Sumbawa, and Flores.

Species: Two. One of these was originally described as a subspecies of the other by the conservative ATTEMS, but a close comparison of the gonopod structure reveals basic differences that are surely of specific importance.

The affinities of the two species of *Sundarhacus* with other Asiatic platyrhacids are at the present entirely obscure. In body form they are not appreciably different from many small species in the "*Zodesmus*" Group. If the telopodite of the gonopod were to be shortened and straightened out, the effect, particularly in *S. sterilis* would be reminiscent of the form characteristic of the Neotropical genus *Psammodesmus*, in which the seminal groove runs up the dorsal side of the telopodite and on to the solenomerite which projects in a direction away from the coxa. But in their actual form, the gonopods in *Sundarhacus* are entirely different from any existing type known to me in the family. In particular, the enormously enlarged prefemoral macrosetae appear to be unique and diagnostic for the genus.

ATTEMS (1932) placed both *fecundus* and *sterilis* in a new subgenus *Ozorhacus* along with eight other species (of which *Platyrhacus katantes* Attems, 1899, was designated as type). It is immediately apparent that "*Ozorhacus*" is a very heterogeneous melange, its components actually referable to at least three different genera.<sup>1</sup> Whether or not *katantes* represents a generic type for which an old name is already available, it is certainly not congeneric with the two species *fecundus* and *sterilis*.

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<sup>1</sup> Of the originally included species placed in *Ozorhacus* by ATTEMS, I have already allocated *sarasinorum*, *tetanotropis*, and *postumus* to the Celebesian genus *Erythrachus*. Resolution of the East Indian platyrhacid genera is still a long way off, yet I can now observe that, of the other *Ozorhacus* species, *amblyodon* appears to fit into *Zodesmus*; *mortoni* into *Eurydirorhachis*; and *arietis* probably also goes into *Erythrachus*. *P. (O.) celebs* is obviously a member of the dominant Sumatran genus for which the oldest name is either *Acisternum* Silv. or *Odontodesmus* Saussure.

**Sundarhacus fecundus (Carl), new combination**

*Platyrrhacus fecundus* Carl, 1912, Zool. Jahrb., Abt. Syst., vol. 32, p. 164, pl. 1, fig. 7 (Sadjang, Lombok; Elbert, leg. Syntypes, Mus. Genève, a lectotype was designated by me in July, 1964).

*Platyrrhacus fecundus*: Attems, 1930, Mitt. Zool. Mus. Berlin, vol. 16, p. 132, figs. 17, 18 (Swela, Luatallu, and Sembalœn, Lombok; and Batœ Doelang, Sumbawa).

*Platyrrhacus (Ozorhacus) fecundus*: Attems, 1938, Das Tierreich, lief. 68, p. 255, fig. 284.

Diagnosis: Easily distinguished from *S. sterilis* by the moderately curved telopodite with smaller and simpler terminations, by the much heavier prefemoral macrosetae, and other qualitative gonopod characters apparent in the illustrations.

Description (♂ lectoparatype from Sadjang): A small, slender, dorsally convex platyrrhacid with narrow and depressed paranota. Color of metatergites, head, antennae, and legs light brown (a darker effect is caused by adherent dirt particles); prozonites almost completely whitish-gray.

Length approximately 38 mm., greatest width 5.6 mm., W/L ratio 17.7%. Body essentially parallel-sided over most of its length. widths of selected segments as follows:

2nd—5.6 mm	12th—5.5 mm
4th—5.5	14th—5.4
6th—5.5	16th—5.3
10th—5.6	18th—4.6

Head uniformly granular; subantennal swellings inconspicuous; genae not margined laterally. Interantennal isthmus narrow, only slightly wider than length of 1st antennomere. Median and dorsal edges of antennal sockets elevated. Antennae rather short (4.4 mm) and slender, extending back to posterior edge of 2nd paranota. Antennal articles 1-6 similar in size and shape except that 6th is slightly longer; none are obviously constricted at base nor clavate distally; 7th article abruptly narrower than 6th, subconical in shape, with four small sensory cones.

Collum transversely elongate-hexagonal, about as wide as head, its lateral ends symmetrically narrowed, acutely angular. Surface

flat, evenly and densely granular, with an anterior submarginal transverse row of 8-10 enlarged tubercules, followed by a very faintly impressed smooth area.

Paranota of anterior segments strongly depressed, continuing slope of middorsum, those of segment 2 extending ventrad well below level of those of collum and segment 3. Paranota of segments 2-18 essentially transverse; the lateral ends rounded on segments 2 and 3; the anterior corners rectangular on segments 3-14, posterior corners rectangular on segments 3-5, thereafter becoming slightly more acute and produced caudally back to segment 19. Paranota short and narrow, less than half the metazonite diameter, and widely separated from those of adjoining segments. Lateral edges chiefly with four rounded marginal tubercules, and notched or incised between the 2nd and 3rd; peritreme small, inconspicuous, located usually on the base of the 3rd lateral tubercule and facing dorso-laterally.

Dorsal surface of metazonites densely and evenly granular, the granules largest on paranotal surface; on posterior segments there is some development of three transverse rows of tubercules of which only the posterior submarginal becomes distinct and prominent. Surface of prozonites dull, densely and minutely punctate and roughened.

Stricture distinct entirely around segments, becoming most prominent ventrally, partly overhung by the subcoxal area of the podosterna. Latter abruptly elevated, the surface glabrous, not produced into subcoxal spines. Anterior stigmata prominent and elevated, overlapping on to the dorsal coxal condyles and projecting laterally; posterior stigmata crowded forward and in contact with anterior above the anterior coxal socket, set a little higher up on the sides and not quite so sharply elevated above segmental surface than are the anterior stigmata. Sides of metazonites smooth and unmodified except for a few very flat scattered tubercules, and a small cluster of more acute tubercules just above base of posterior legs.

Legs long (4.9 mm), most of femur visible beyond paranota when extended and seen in dorsal aspect. Length order of podomeres:  $3 > 6 > 2 = 5 = 4 = 1$ . Coxae virtually glabrous, prefemora with a few scattered short setae and a long slender macroseta at the ventral distal end; remaining podomeres becoming increasingly

setose, hairs on ventral surfaces somewhat longer than the others. Tarsal claw short, nearly straight, unmodified.

Epiproct broad and spatulate, its lateral edges slightly divergent at the base, then converging distally in a semicircular outline; upper surface sparsely granulate with two prominent setiferous subterminal tubercles. Paraprocts slightly tuberculate, the



FIG. 1-3.

Genus *Sundarhacus*. Male gonopods.

FIG. 1: *S. fecundus* (Carl), left gonopod of paratype, mesial aspect. — FIG. 2: *S. fecundus*, lateral aspect of base of prefemur of left gonopod, showing correct proportions of enlarged macrosetae. — FIG. 3: *S. sterilis* (Attems), mesial aspect of left gonopod of holotype. Fig. 1 and 3 drawn to same scale, Fig. 2 considerably more enlarged.

median rims thickened and polished, becoming broader dorsally; discal setiferous tubercule located at about midlength of paraproct, in contact with the median rim. Hypoproct slightly wider than long, subtrapezoidal in outline, its basal edge overlapping segment 19 at the midventral line, distally with two large paramedian setiferous tubercules which do not exceed the distal edge.

Anterior legs smaller and shorter immediately behind the head, but otherwise unmodified. Sterna of anterior segments without paramedian processes, the sternum of segment 6 broadened and excavated to accommodate the gonopods.

Gonopods of the form shown in figures 1, 2, and 4. In situ, the two gonopods extend forward parallel to each other, curving dorsally in contact with sternum of segment 6. Coxae relatively large, connected only by membrane, largest about at midlength, narrowing distally. Dorsal side with two elongated, distally lacinate setae. Prefemora massive, lying in same axis with coxa, invested on the ventral and lateral sides with stout macrosetae, some of which are enormously enlarged, plectriform (fig. 2) and distally fringed. Femoral region set at nearly a right angle to prefemur, merging imperceptibly into tibiotarsus with no indication of segmentation. Telopodite curved dorsad and somewhat twisted laterally, the seminal groove beginning at base of prefemur on medial side, thence displaced to the lateral side particularly by torsion of the distal fourth of the appendage. Median edge of telopodite with an acute retrorse marginal dentation. Gonopod terminating with an enlarged subtriangular tibiotarsus, its apex pointing dorsally toward middle of coxa, and a prominent, medially-placed "L" shaped solenomerite. A smaller, acutely triangular lobe occurs at base of solenomerite on the lateral side.

Distribution: This species is so far known only from the adjacent islands of Lombok and Sumbawa. ATTEMS' (1930) illustration of the gonopod of a Sumbawa specimen suggests differences perhaps of subspecific nature from the typical Lombok configuration.

### **Sundarhacus sterilis (Attems), new combination**

*Platyrhacus fecundus sterilis* Attems, 1930, Mitt. Zool. Mus. Berlin, vol. 16, p. 133, figs. 19, 20 (Rana Mese, Flores; Rensch, leg. ♂ holotype, Mus. Senckenberg 831).

*Platyrrhacus (Ozorhacus) fecundus sterilis*: Attems, 1938, Das Tierreich, lief. 69, p. 256, fig. 285.

Diagnosis: Structurally similar to *S. fecundus*, except lateral edges of paranota with 5-6 tubercules instead of four; ozopores

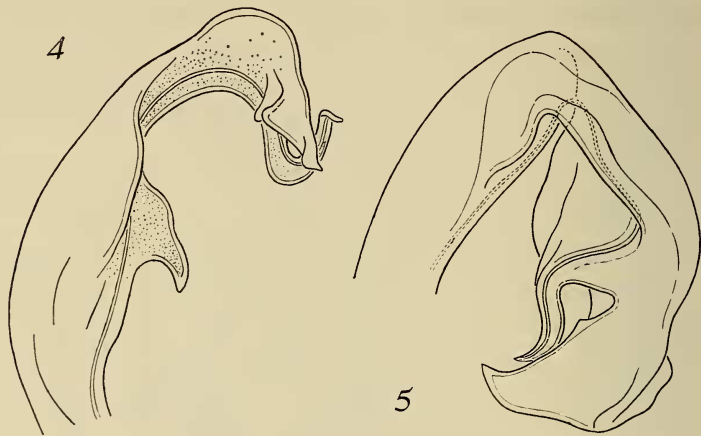


FIG. 4, 5.

Genus *Sundarhacus*. Male gonopods.

FIG. 4: *S. fecundus* (Carl), lateral aspect of distal half of telopodite of left gonopod, paratype. — FIG. 5: *S. sterilis* (Attems), same, from holotype.

removed from edge by a distance about equal to one diameter; and metatergites with three distinct transverse series of enlarged tubercles on most segments. Gonopods differing in several important details: the prefemoral macrosetae are not so thick and are not distally penicillate, the medial edge of the telopodite is less twisted laterally and is not produced into an acute spine, and the distal half of the appendage is abruptly, geniculately recurved back toward the coxa. There is a prominent lobe at base of solenomerite, but it is located on the median instead of the lateral side as in *fecundus*.

Distribution: This species is apparently known so far only from the unique holotype, collected on the western end of Flores.

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